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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,585	06/21/2001	Daniel M. Lavery	2207/11237	6346

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SHARMINI N. GREEN
C/O BLAKLELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025

EXAMINER	
RAMPURIA, SATISH	
ART UNIT	**PAPER NUMBER**
2124	6

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/886,585	LAVERY ET AL.	
	Examiner	Art Unit	
	Satish S. Rampuria	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/27/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the application filed on 06/21/2001.

2. Claims 1-30 are pending.

Information Disclosure Statement

3. An initialed and dated copy of Applicant's IDS form 1449, Paper No. 03, is attached to the instant Office action.

Claim objections

4. Claim 28 is objected to because of the following informalities: at the end of the sentence the period (".") is missing. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Publication No. 2002/0144083 to Wang et al., hereinafter called Wang, in view of US Patent No. 5,926,819 to Doo et al., hereinafter called Doo.

Per claim 1:

Wang disclose:

- A method for executing a code (page 7, paragraph 88 "executing instructions")
- receiving a trigger instruction (page 3, paragraph 47 "an event triggers the invocation and execution")
- executing an auxiliary code (page 3, paragraph 44, "the instruction is executed" and page 7, paragraph 47 "execution of a pre-computation slice (p-slice code)")

Wang does not explicitly disclose selecting an entry in a trigger table, the entry associated with the trigger instruction and entry is referenced by the trigger table.

However, Doo, in an analogous computer system discloses selecting an entry in a trigger table (col. 6, lines 30-31 "associating that trigger with the table in the data dictionary"), the entry associated with the trigger instruction and entry is referenced by the trigger table (col. 6, lines "a reference to memory for trigger-type specific parameters").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claim 2:

The rejection of claim 1 is incorporated, and further, Wang disclose:

- spawning a new thread, the new thread executing instructions included in the auxiliary code (page 5, paragraph 67 "executes a spawn instruction to initiate the speculative thread, and then returns". Also, see fig. 9)

Per claim 3:

The rejection of claim 2 is incorporated, and further, Wang disclose:

- executing the new thread concurrently with a parent thread, the parent thread including the trigger instruction (page 5, paragraph 67 "executes a spawn instruction" and page 47, paragraph 47 "Speculative threads... spawned under... conditions... encountering a basic trigger... occurs when a designated instruction in the main (parent) thread is retired, or... encountering a chaining trigger, when one speculative thread explicitly spawns another speculative thread")

Per claims 4 and 11:

Wang disclose:

- A method for executing a code (page 7, paragraph 88 "executing instructions")
- receiving a trigger instruction (page 3, paragraph 47 "an event triggers the invocation and execution")
- executing a p-slice code (page 3, paragraph 44, "the instruction is executed" and page 7, paragraph 47 "execution of a pre-computation slice (p-slice code)")

Wang does not explicitly disclose selecting an entry in a trigger table, the entry associated with the trigger instruction and entry is referenced by the trigger table.

However, Doo, in an analogous computer system discloses selecting an entry in a trigger table (col. 6, lines 30-31 "associating that trigger with the table in the data dictionary"), the entry associated with the trigger instruction and entry is referenced by the trigger table (col. 6, lines "a reference to memory for trigger-type specific parameters").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claim 5:

The rejection of claim 4 is incorporated, and further, Wang disclose:

- spawning a new thread, the new thread executing instructions included in the auxiliary code (page 5, paragraph 67 "executes a spawn instruction to initiate the speculative thread, and then returns" and page 7, paragraph 47 "execution of a pre-computation slice (p-slice code)"). Also, see fig. 9)

Per claim 6:

The rejection of claim 5 is incorporated, and further, Wang disclose:

- executing the new thread concurrently with a parent thread, the parent thread including the trigger instruction (page 5, paragraph 67 "executes a spawn instruction" and page 47, paragraph 47 "Speculative threads... spawned under... conditions... encountering a basic trigger... occurs when a designated instruction in the main (parent) thread is retired, or... encountering a chaining trigger, when one speculative thread explicitly spawns another speculative thread")

Per claims 7 and 9:

The rejection of claim 6 is incorporated, and further, Wang disclose:

- storing state information from the parent thread before spawning the new thread (page 4, paragraph 64 "The main thread stores a sequence of values into the live-in buffer before spawning the speculative thread,")

Per claims 8 and 10:

The rejection of claims 7 and 9 are incorporated, respectively, and further, Wang disclose:

- copying the state information for use in the new thread (page 3, paragraph 48"Copying necessary live-in values into the hardware thread context's register")

Per claim 12:

The rejection of claim 4 is incorporated, and further, Wang disclose:

- reading an instruction pointer for the p-slice code from the entry in the trigger table (page6, paragraph 85 "Each entry in the OSC includes a counter, the instruction pointer

(IP) of a load of interest, and the address of the first instruction in a pre-computation slice, which identifies which pre-computation slice corresponds to this OSC entry").

Claim 13 is the computer program product claim corresponding to method claim 1 and rejected under the same rational set forth in connection with the rejection of claim 1 above.

Claim 14 is the computer program product claim corresponding to method claim 2 and rejected under the same rational set forth in connection with the rejection of claim 2 above.

Claims 15 and 18, 21 are the system claim corresponding to method claim 1 and rejected under the same rational set forth in connection with the rejection of claim 1 above.

Claims 16 and 19 are the system claim corresponding to method claim 2 and rejected under the same rational set forth in connection with the rejection of claim 2 above.

Claims 17and 20 are the system claim corresponding to method claim 7 and rejected under the same rational set forth in connection with the rejection of claim 7 above.

Per claims 22 and 24:

Wang disclose:

- A method for compiling (page 2, paragraph 33 "each bundle is comprised of three instructions grouped together by the compiler")
- receiving a function body (page 4, paragraph 55, "Whenever a load (functions or code) is executed"), the function body comprising a trigger instruction (page 4, paragraph 55 "a... number of instructions prior in the... execution... marked as a potential basic trigger")

- outputting an auxiliary code associated with the function body and the trigger instruction (page 3, paragraph 44, "the instruction is executed" and page 7, paragraph 47 "execution of a pre-computation slice (p-slice code)")

Wang does not explicitly disclose creating an entry in a trigger table the entry associated with the trigger instruction and the auxiliary code.

However, Doo, in an analogous computer system discloses creating an entry in a trigger table (col. 6, lines 30-31 "associating that trigger with the table in the data dictionary"), the entry associated with the trigger instruction and the auxiliary code (col. 6, lines "a reference to memory for trigger-type specific parameters").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claims 23 and 27:

The rejection of claims 22 and 24 is incorporated, respectively, and further, Wang disclose:

- creating a stub block, the stub block comprising a spawn instruction, the spawn instruction configured to spawn a new thread, the new thread configured to execute the auxiliary code (page 5, paragraph 67 "executes a spawn instruction to initiate the

speculative thread, and then returns". Also, see fig. 9). It is inherent to create the stub block in order to execute the spawn instructions.

Per claim 25:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

- receiving the p-slice code associated with the function body and the trigger instruction (page 3, paragraph 47 "an event triggers the invocation and execution of a pre-computation").

Per claim 26:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

- generating the p-slice code (page 4, paragraph 54 "create the pre-computation slice for each load") associated with the function body and the trigger instruction (page 5, paragraph 76 "process... triggers to basic pre-computation slices").

Per claim 28:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

- adding store instructions to the stub block, the store instructions configured to store state information of a current thread (page 4, paragraph 63 "Using on-chip memory... because without flash-copy... one thread cannot directly access the registers of another thread") the state information of the current thread including values contained in live-in registers

of the new thread (page 4, paragraph 64 "The main thread stores a sequence of values into the live-in buffer before spawning the speculative thread,")

Claims 29 and 30 are the computer program product claim corresponding to method claim 24 and rejected under the same rational set forth in connection with the rejection of claim 24 above.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patent is cited to further show the state of the art with respect to optimizing execution of in a computer system.

US Patent No. 6,341,371 to Tandri

US Patent No. 6,072,951 to Donovan et al.

US Patent No. 6,564,373 to Hughes et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Satish S. Rampuria** whose telephone number is **703-305-8891**. The examiner can normally be reached on **8:30 am to 5:00 pm**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Kakali Chaki** can be reached on **(703) 305-9662**. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria

Patent Examiner

Art Unit 2124

05/17/2004

TODD INGBERG
PRIMARY EXAMINER